MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2021/2022

DCP5101 – PROGRAM DESIGN

11 AUGUST 2022
9.00 a.m. - 11.00 a.m.
(2 Hours)

Question	Mark
1	
2	
3	
4	

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 11 pages.
2. There are **FOUR (4)** questions. Each question carries 10 marks.
3. Answer ALL questions.
4. Please write your answers in this **Question Paper**.

QUESTION 1 [10 MARKS]

Unless otherwise stated, every code segment provided in every question below is contained within a main() function, complete with the directive #include <stdio.h>, #include <math.h>, and return 0;

Write the output as the result of execution of the following code segments in the box on the right.

(a)	int a = 5, b = 2, c = 1, d;
	d = 2 * b – 3 *.(4 + c) + a ;
	printf("%d", d);	

(b)	int x=1, y=2, z=3;
	switch(x) {
	case 0: x = 2;
	y = 4;
	z = 6;
	break;
	case 1: x = 5;
	break;
	default:
	y = 5;
	x = 1;
	}
	printf("%d %d %d", x, y, z);	

(c)	int a = 0, b = 8, c = 2;
	
	if (a >= 0 || b >10)
	a = 9;
	else
	c = 5;
	printf("%d %d %d", a, b, c);	

(d)	int x = 1, y = 9;
	while (x < 6)
	{
	x += 2;
	y = y + x;
	}
	printf("%d %d", x, y);	

(e)	float a = 2.4, b = 9.5;
	int c = **ceil**(a) + **floor**(b)
	printf("%d", c);	

Continue ...

(f)	int a = 0, b = 0;
	for (a = 10; a > 8; a--)
	{
	b = 2* a - 2;
	printf("%d\n", a);
	}
	printf("%d", b);	

(g)	int x, y;
	for(x=1; x <= 3; x++) {
	for(y=1; y <= x; y++) {
	printf("%d", x);
	}
	printf("\n");
	}	

(h)	int a[5] = {2, 4, 6, 8, 10}; int answer = 4 * a[2] – 2 * a[4]; printf("%d", answer);	

(i)	int **calc**(int, int);
	
	int **main**( )
	{
	int a = 5, b = 2;
	int c = **calc**(a, b);
	printf("%d", c);
	return 0;
	}
	
	int **calc**(int x, int y)
	{
	x = 2 * y;
	y = x + 5;
	return (x + y);
	}	

(j)	int x = 0, y = 1, z = 2;
	int *ptr1 = &z;
	int *ptr2 = &x;
	ptr2 = ptr1;
	*ptr1 = 5;
	
	printf("%d", y + *ptr1 + *ptr2);	

Continue ...

QUESTION 2 [10 MARKS]

a) **Draw a flowchart** to accept a set of positive integers from the user (enter a negative number to end input), and then output the *sum of all even numbers* entered by the user.

[5 Marks]

Sample Run 1:	**Sample Run 2:**
Enter integers: **10 3 2 -4** Sum : 12	Enter integers: **1 32 4 21 2 -1** Sum : 38

Answer:

Continue ...

b) **Write a C program** based on your program design in (a).

[5 Marks]

Continue ...

QUESTION 3 [10 MARKS]

a) What is the different between a **call-by-value** parameter and a **call-by-reference** parameter?

[2 marks]

b) The following program should compute the Body Mass Index (BMI). It accepts the height (in meters) and weight (in kilograms) from a user and use the following formula to compute the BMI value for the user:

BMI = weight in kilograms / (height in meters * height in meters)

```
#include<stdio.h>

int main()
{
    float weightInKilograms, heightInMeters, BMI;

    printf("Please insert your weight in kilograms: ");
    scanf("%f", &weightInKilograms);

    printf("Please insert your height in meters: " );
    scanf("%f", &heightInMeters);

    BMI = weightInKilograms/(heightInMeters*heightInMeters);
    printf("Your BMI: %.2f\n", BMI);

    if(BMI < 18.5)
        printf("Underweight\n");
    else if(BMI >= 18.5 && BMI < 25.0)
        printf("Normal\n");
    else if(BMI >= 25.0 && BMI < 30.0)
        printf("Overweight\n");
    else if(BMI >= 30.0)
        printf("Obese\n");

    return 0;
}
```

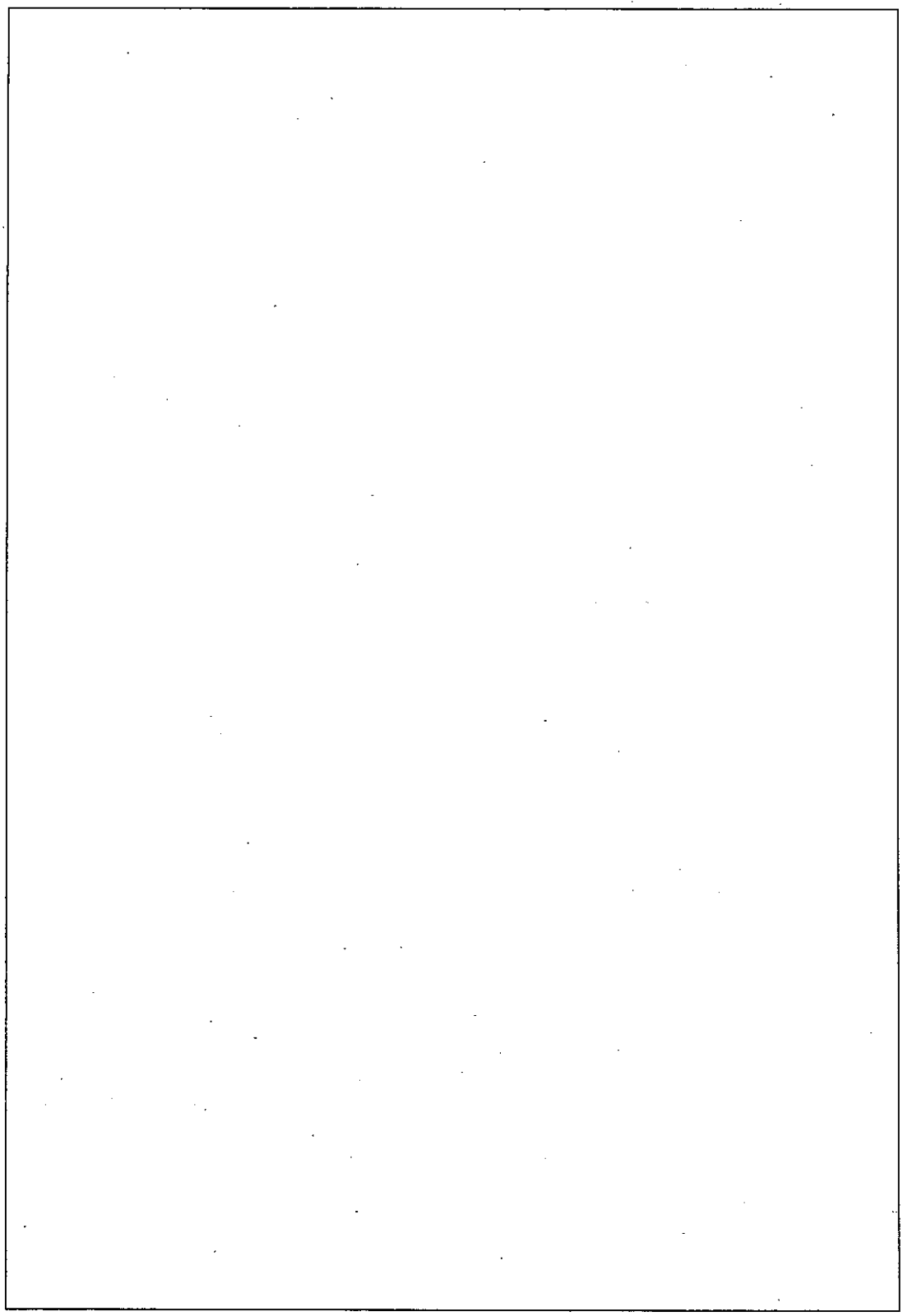
Continue ...

Rewrite the program using functions for the following purposes:

- *getInput(...)*: to get the user's height and weight in meters
- *computeBMI(...)*: to compute and return the BMI value
- *displayResult(...)*: to inform the user the result of the BMI computation
- Call these three functions from the int main()

[8 marks]

Continue ...



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QUESTION 4 [10 MARKS]

You are assigned to write a hotel booking system for JW Mariott Hotel in Putrajaya. Table 3 shows the price of a hotel room based on the type of rooms.

Table 3: Price of hotel rooms

Room Type Code	Type of Room	Price (RM)
S	Standard Room	300.00
D	Deluxe Room	350.00
F	Family Room	450.00
P	Presidential Suite	800.00

Write a C program based on the following descriptions.

- Open a text file called *customerbooking.txt* for writing.
- Create a structure called *HotelBooking*. Declare the following variables:
  - Customer name: *cust_name (array of char)*
  - Route code: *room_type (char)*
  - Room price: *price (float)*
  - Number of rooms: *no_room (int)*
  - Total price for the booking: *total_price (float)*
- Create an array of structure variable called *bookings* with size of 3, which represents for three users.
- Using *for* loop:
  - Get user's input for the room type and number of rooms.
  - Use *switch-case* or *else-if* statement to determine the *price* based on the room type. Refer to Table 3.
  - Calculate the total amount of hotel booking for each user.
  - Write the booking record for each user to the *customerbookings.txt* file.

Note: You need to declare all the necessary variables.

SAMPLE RUN (*user input*)

```
Customer name: Tom Sheperd
Room Type : S
Number of Rooms : 3

Customer name: John Sheldon
Room Type : D
Number of Rooms : 2

Customer name: Michelle Austen
Room Type : P
Number of Rooms : 1
```

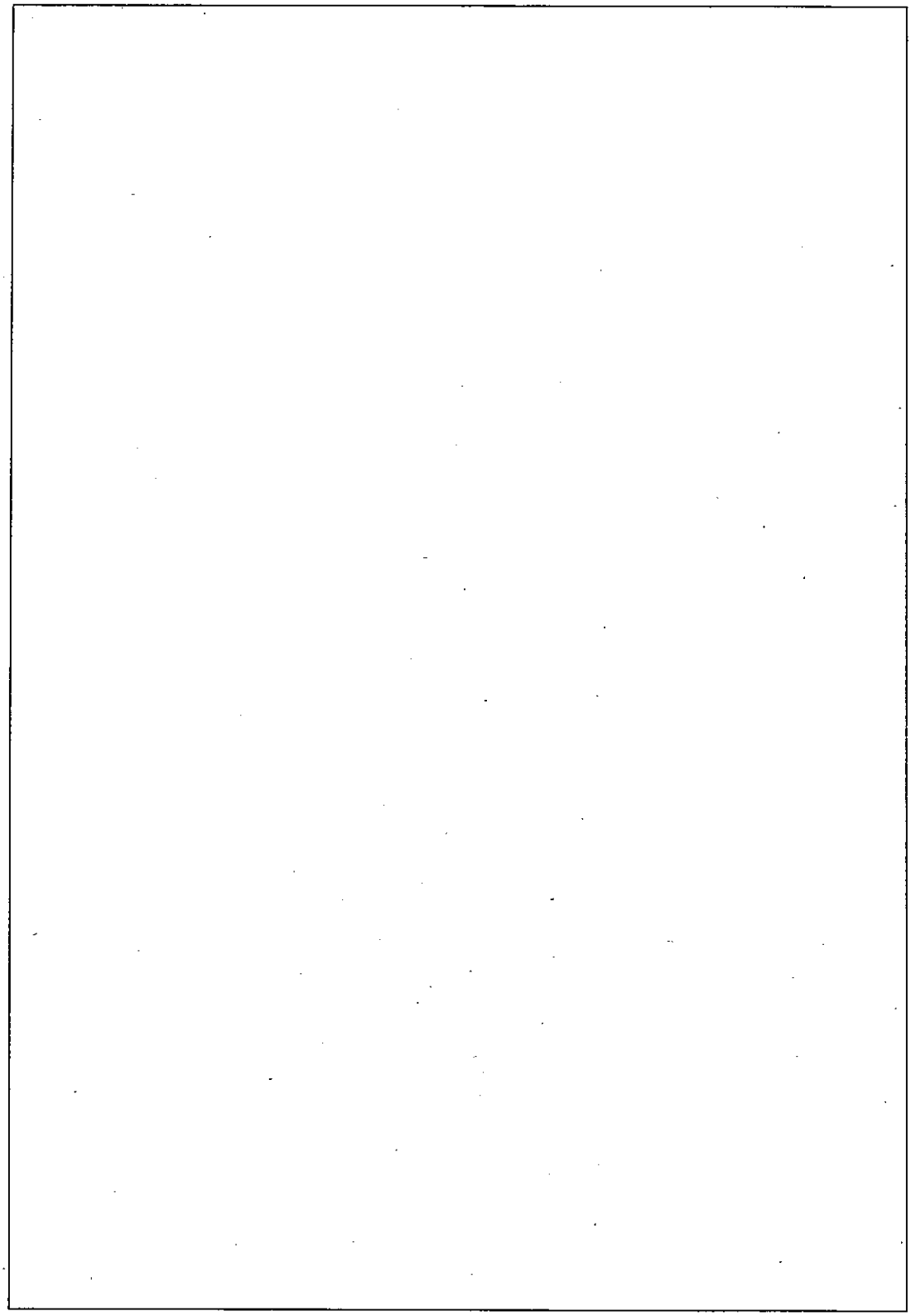
SAMPLE OUTPUT (*customerbookings.txt*)

```
Name: Tom Sheperd
Booking: 3 Standard Room
Total price: RM 900.00

Name: John Sheldon
Booking: 2 Deluxe Room
Total price: RM 700.00

Name: Michelle Austen
Booking: 1 Presidential Suite
Total price: RM 800.00
```

Continue ...



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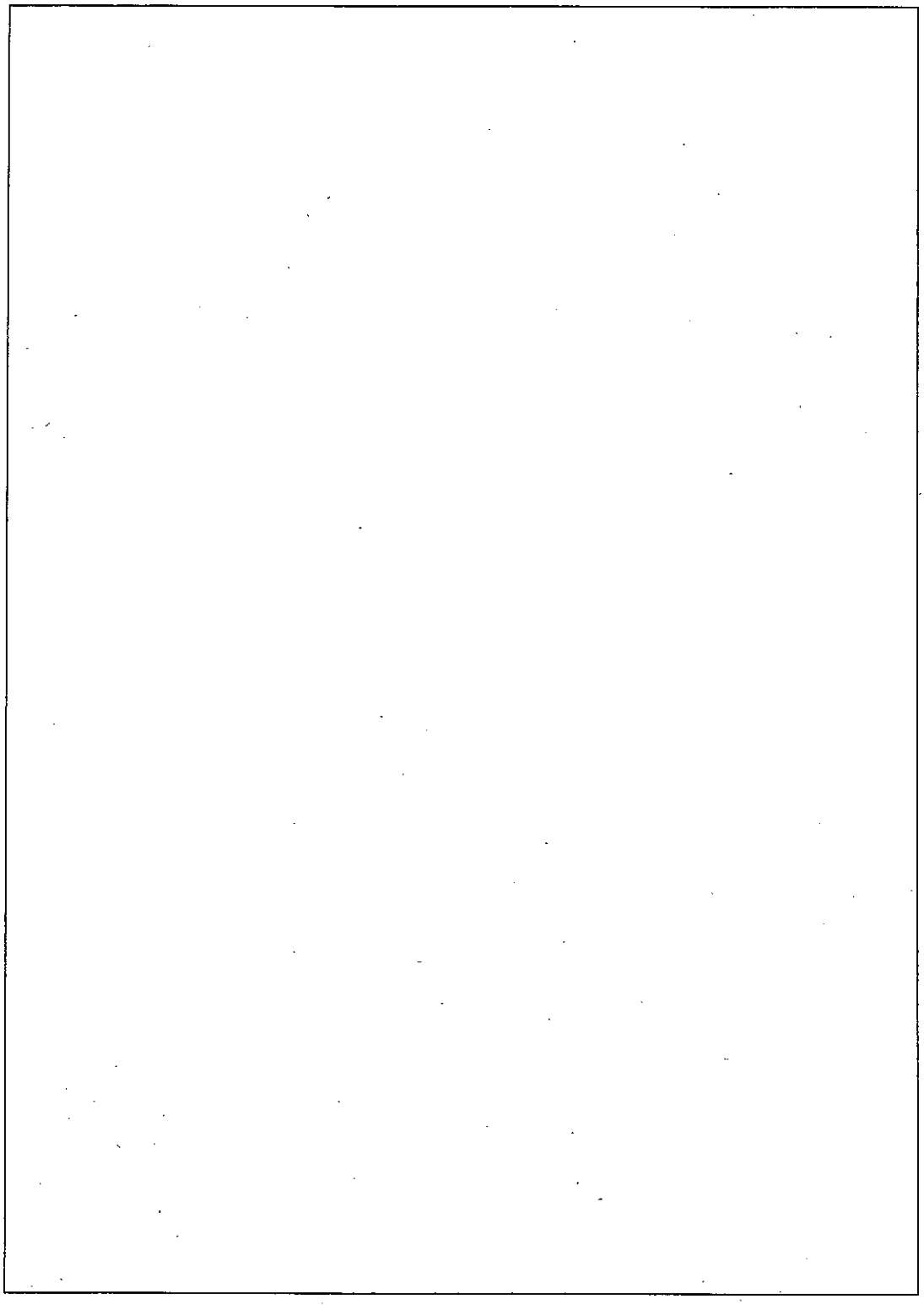

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